

## THE GENUS *TOMOCERUS* NICOLET (COLLEMBOLA, TOMOCERIDAE) FROM HUNAN, CHINA WITH DESCRIPTIONS OF TWO NEW SPECIES

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**Abstract** Three species, including two new species, *Tomocerus* (*Tomocerus*) *hexipunctatus* sp. nov. and *Tomocerus* (*Tomocerus*) *multisetus* sp. nov., and a known species *T.* (*T.*) *kinoshitai* Yosii, 1954 are described and illustrated from Hunan, China.

**Key words** Collembola, Tomoceridae, *Tomocerus*, new species, Hunan, China.

The genus *Tomocerus* was erected by Nicolet (1842) with *Macrotoma minor* Lubbock, 1862 as the type species (ICZN, 1954). Yosii (1967) divided *Tomocerus* into three subgenera: *Monodontocerus*, *Tomocerina* and *Tomocerus* s. str. The subgenus *Tomocerus* s. str. is the largest, including 27 species in China (Sun *et al.*, 2006). Of them, only *T.* (*T.*) *kinoshitai* Yosii, 1954 was reported in Hunan before. While examining specimens of Collembolan collected from Hunan, China, we found two new species: *T.* (*T.*) *hexipunctatus* sp. nov. and *T.* (*T.*) *multisetus* sp. nov. They are described below.

The specimens studied in this work were mounted on slides, deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS).

Abbreviations used include: Ant. I = Antennal segment I; Th. I = Thoracic segment I; Abd. I = Abdominal segment I.

The terminology and morphological interpretations used in this paper follow Yosii (1967). Measurements are in millimeters (mm).

1 *Tomocerus* (*Tomocerus*) *hexipunctatus* sp. nov. (Figs. 1–10, Table 1)

Body length 2.1–3.4 mm (Fig. 1).

Color. Ground color brownish yellow. Eye patches black. Ant. III and Ant. IV annulated, deep purple. Lateral margin of Th. II and III and Abd. I with black pigment. Two dark purple patches present on Abd. III and four dark purple patches present on Abd. IV. Scales brown.

Head. Eyes 6 + 6 and subequal. Antennae 0.93–0.97 times as long as body and 4.43–5.06 times as long as head. Ratios of Ant. I : II : III : IV = 1.0 : 1.2 : 9.2 : 12.0 : 1.0. Dorsal macrochaetae of head as shown in Fig. 2. About 33 setae present on posterior head. Labral setae 4/5, 5, 4, all smooth; each of distal 3 rows beset on papilla. Anterior margin of labrum with 4 recurved

spines (Fig. 3).

Thorax. Macrochaetae and bothriotricha as shown in Fig. 4. Tibiotarsus with numerous pointed smooth setae of different size; ventral side with 4, 4, 4 large blunt spiny setae respectively on legs I–III (Fig. 6). Unguis slender; a pair of pseudonychia well developed, 0.56–0.64 times as long as inner edge of unguis; inner tooth 1, 1 and 1 respectively on legs I–III. Unguiculus lanceolate without outer tooth or inner tooth. Tenent hair thick, 0.93–1.14 times as long as inner edge of unguis, apex spatulate (Fig. 7). Trochanteral organ reduced to 1, 1 seta (Fig. 5).

Abdomen. Tenaculum unscaled, with 4 + 4 teeth and 12–13 smooth setae on corpus (Fig. 8). Ventral tube unscaled, anterior, posterior and lateral sides with numerous large and small setae. Ratios of manubrium/dens/mucro = 3.4 : 3.6/4.0 : 4.8/1.0. Manubrium scaled, with 12 large setae on each dorsolateral side, all mildly ciliate and sharply tapered near apex. Dentes without large setae on outer edge and basal scalelike spine on inner edge. Dental spines formula as 4/6/4/5, I, 1, I, pale brown, each with toothlets on dentes (Fig. 9). Mucro elongate covered with numerous ciliate setae; outer basal tooth with a corner toothlet. Outer dorsal lamella bearing 5–6 intermediate minute teeth; apical and antepical teeth subequal (Fig. 10).

Holotype ♀, China, Hunan, Zhushitou (29.2°N, 95.1°E), 350 m, 19 Aug. 1988, collected by ZHANG Xiaochun (IZCAS). Paratypes: 3 ♀♀ (all on slides), same data as holotype; 2 ♀♀, Hunan, Yongshun, 600–800 m, 7–8 Aug. 1988, collected by ZHANG Xiaochun (IZCAS).

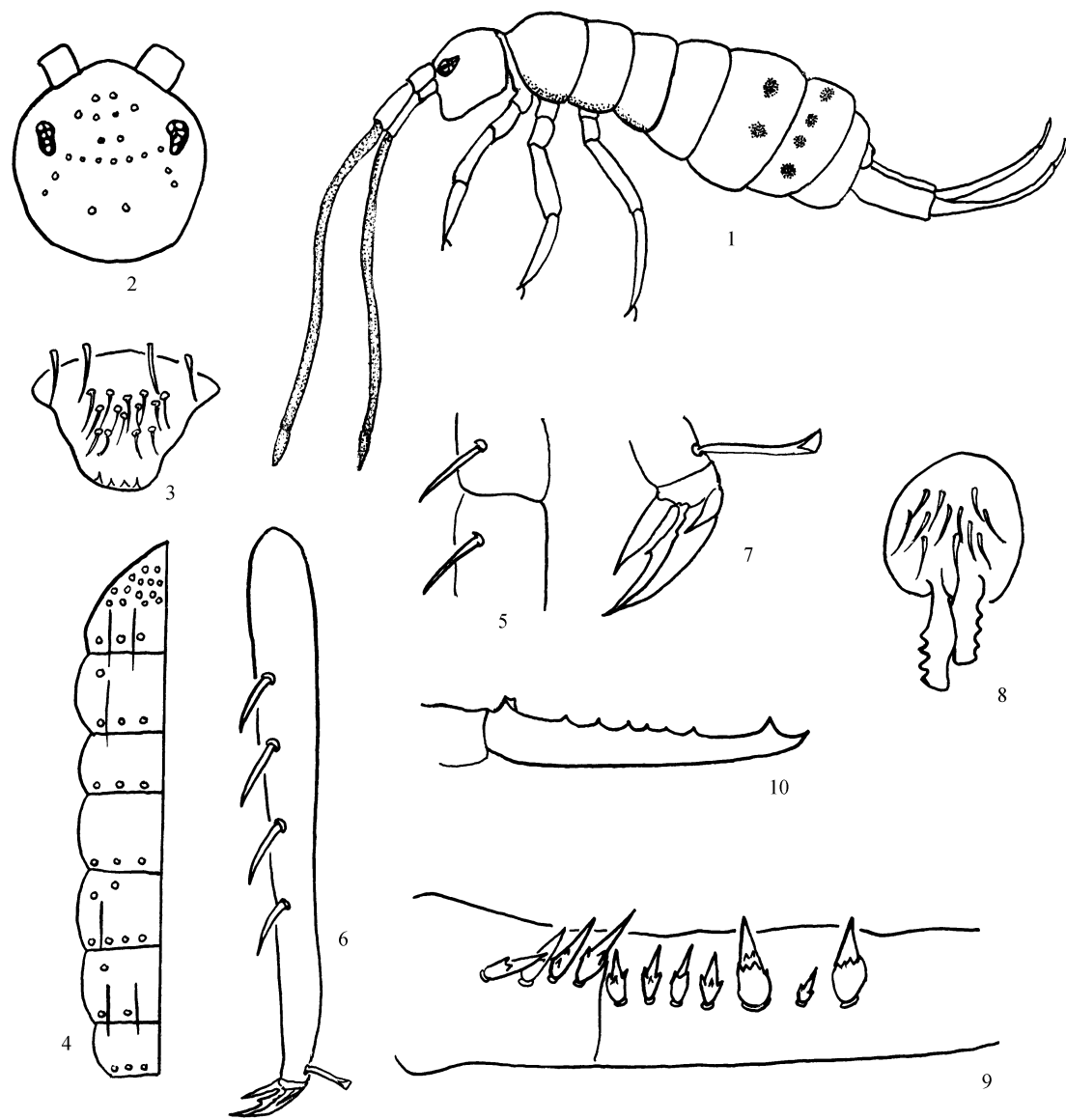
**Etymology.** The new species is named after the six patches on Abd. III and IV.

**Remarks.** This species is similar to *T.* (*T.*) *asahinai* Yosii, 1954, but can be separated from the latter by the characters listed in Table 1.

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Figs 1-10. *Tomocerus (Tomocerus) hexipunctatus* sp. nov. 1. Habitus. 2. Dorsum of head. 3. Labrum. 4. Dorsal chaetotaxy of body (Th. II-Abd. V). 5. Trochanteral organ. 6. Hind tibiotarsus and hind claw. 7. Detail of hind foot complex. 8. Tenaculum. 9. Dental spines. 10. Mucro.

**Table 1. Comparison between *T. (T.) hexipunctatus* sp. nov. and *T. (T.) asahinai* Yosii, 1954.**

Characters	<i>T. (T.) hexipunctatus</i> sp. nov.	<i>T. (T.) asahinai</i> Yosii, 1954
Color pattern on body	Six dark purple patches	Coxal basis of all legs diffusely dark
Dental spine pattern	Compound type	Mixture of simple and compound types
Unguis inner tooth	1, 1, 1	Up to 7, 7, 7

**2 *Tomocerus (Tomocerus) multisetus* sp. nov.**  
(Figs 1-20, Table 2)

Body length 4.2-5.4 mm (Fig. 11).  
Color. Ground color yellow. Eye patches black.  
Ant. III annulated, 1/2 distal part purple. Lateral margin of Th. II and III with black pigment. Tibiotarsi purple. Hind margin of femur of front legs and front margin of

femur of mesolegs bluish-purple. Scales brown.  
Head. Eyes 6+ 6 and subequal. Antennae almost the same length as long as body and 7.0 times as long as head. Ratios of Ant. I : II: III= 1.0 1.5 15.5. Dorsal macrochaetae of head as shown in Fig. 12. About 15 setae present on posterior head. Labral setae 4/5, 5, 4, all smooth; each of distal 3 rows beset on papilla. Anterior margin of labrum with 4 recurved spines (Fig. 13).  
Thorax. Macrochaetae and bothriotricha as shown in Fig. 14. Tibiotarsus with numerous pointed smooth setae of different size; ventral side with 4, 4, 4 large blunt spiny setae respectively on legs I - III (Fig. 16). Unguis slender; a pair of pseudonychia well developed, 0.45-0.50 times as long as inner edge of unguis; inner tooth 1, 1 and 1 respectively on leg I - III Unguiculus lanceolate without outer tooth or inner tooth. Tenent hair

thick, 0.91 times as long as inner edge of unguis, apex spatulate (Fig. 17). Trochanteral organ reduced to 1, 1 seta (Fig. 15).

Abdomen. Tenaculum unscaled, with 4+4 teeth and 22-25 smooth setae on corpus (Fig. 18). Ventral tube unscaled, anterior, posterior and lateral sides with numerous large and small setae. Ratios of manubrium/dens/mucro = 3.4/3.67/4.6/5.83/1.0. Manubrium scaled, with 12 large setae on each dorsolateral side, all mildly ciliate and sharply tapered near apex. Dentes without large setae on outer edge and basal scalelike spine on inner edge. Dental spines formula as 4/5/4/6, 1, 1, 1, pale brown, of simple type (Fig. 19). Mucro elongate with numerous ciliate setae; outer basal tooth covered with a corner toothlet. Outer dorsal lamella bearing 6-8 intermediate minute teeth; apical and antepical teeth subequal (Fig. 20).

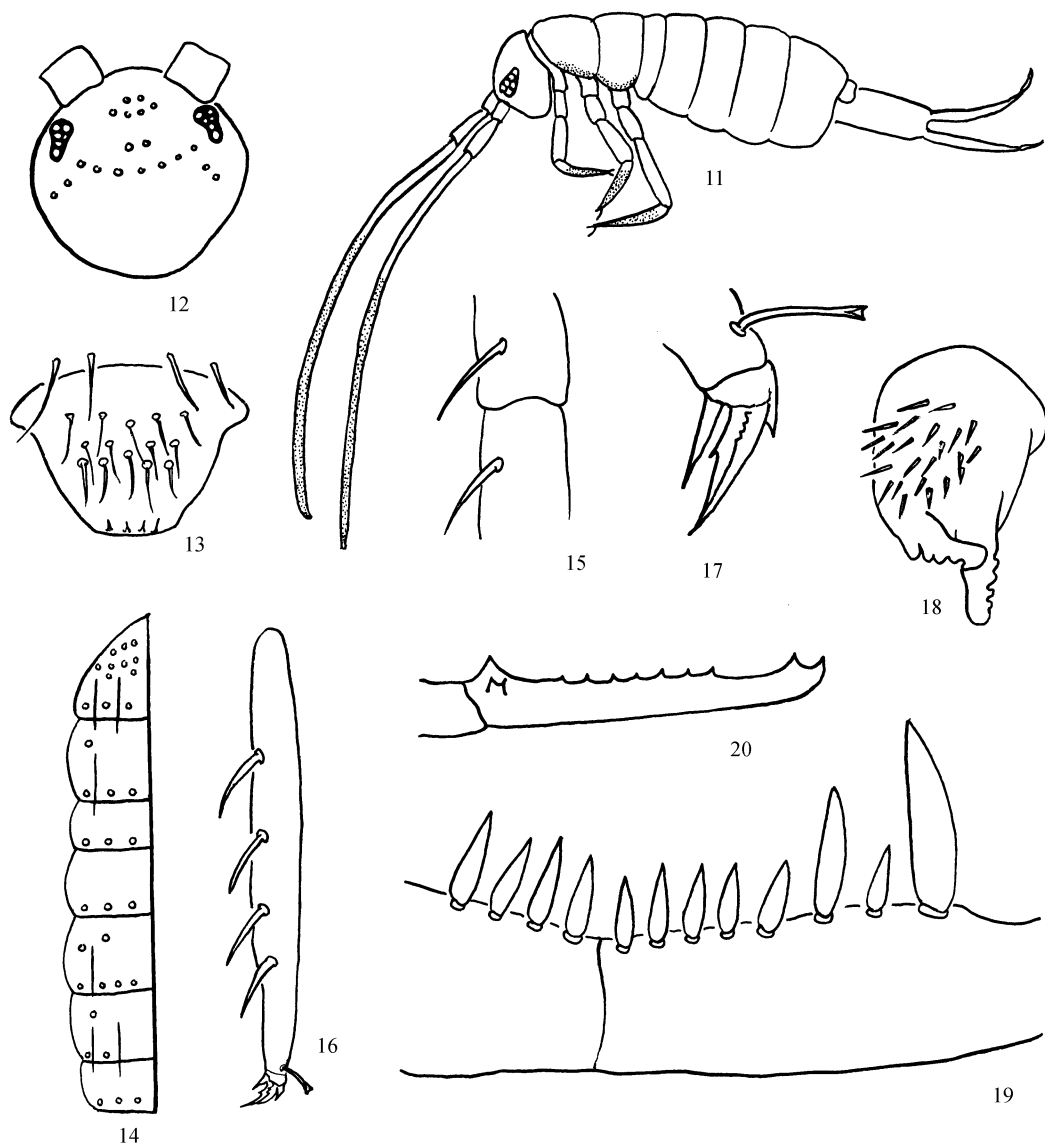
Holotype ♀, China, Hunan, Sangzhi, Tianping Shan (29.2°N, 95.1°E), 1350 m, 14-15 Aug. 1988, collected by ZHANG Xiao Chun (IZCAS). Paratypes: 1 ♂, 2 ♀♀ (all on slides), same data as holotype; 3 ♀♀, Hunan, Yongshun, 600-800 m, 8 Aug. 1988, collected by ZHANG Xiao Chun (IZCAS).

Etymology. The new species is given for the many setae on corpus.

Remarks. This species is similar to *T. (T.) jesonius* Yosii, 1967, but can be separated from the latter by the characters listed in Table 2.

**Table 2. Comparison between *T. (T.) multisetus* sp. nov. and *T. (T.) jesonius* Yosii, 1967.**

Characters	<i>T. (T.) multisetus</i> sp. nov.	<i>T. (T.) jesonius</i> Yosii, 1967
Setae on corpus	23-25 setae	Up to 15 setae
Unguis inner tooth	1, 1, 1	4, 5, 5



Figs. 11-20. *Tomocerus (Tomocerus) multisetus* sp. nov. 11. Habitus. 12. Dorsum of head. 13. Labrum. 14. Dorsal chaetotaxy of body (Th. II-Abd. V). 15. Trochanteral organ. 16. Hind tibiotarsus and hind claw. 17. Detail of hind foot complex. 18. Tenaculum. 19. Dental spines. 20. Mucro.

3 Tomocerus (Tomocerus) kinoshitai Yosii, 1954

*Tomocerus kinoshitai* Yosii, 1954: 814, fig. 29; 1956: 90; 1967: 20, fig. 10; Martynova, 1969: 307, fig. 7; Lee, 1975: 951; Park & Lee, 1995: 439; Liu & Hou, 1998: 1; Huang & Liu, 1999: 20, fig. 2-3.

Specimens examined. China, 4♀♀, Hunan, Yongshun, 600-800 m, 9 Aug. 1988, collected by ZHANG Xiao Chun (IZCAS).

Remarks. This species can be separated from others by the following characters: short antennae, often less than half of the body length; mucro with 0-4 intermediate minute teeth; corpus unscaled with only 1 seta; dental spine formula 3-4/1-2, II, with 3-5 spikes near the basis. This species was found from soil and litter as well as from cave environment (Park & Lee, 1995).

Distribution. China (Chongqing, Fujian, Hunan, Sichuan); Japan, Korea, USSR.

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湖南鳞 属种类记述 (弹尾目, 鳞 科)

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**摘要** 记述采自湖南省的弹尾目 Collembola 鳞 科 Tomoceridae 鳞 属 *Tomocerus* 3 种, 包括 2 新种: 六斑鳞 *Tomocerus* (*Tomocerus*) *hexipundatus* sp. nov. 和多毛鳞 *Tomocerus*

**关键词** 弹尾目, 鳞 科, 鳞 属, 新种, 湖南, 中国.

**中图分类号** Q969.11

(*Tomocerus*) *multisetus* sp. nov. 和 1 个已知种 *T.* (*T.*) *kinoshitai* Yosii, 1954.